WHAT IS CLAIMED IS:

1. A method of manufacturing a crystalline semiconductor film, comprising:

a first step of adding a metallic element for promoting crystallization of an amorphous semiconductor film to an insulating substrate by a spin addition method;

a second step of depositing an amorphous semiconductor film containing silicon on the insulating substrate; and

a third step of forming a crystalline semiconductor film containing silicon by heat treating the amorphous semiconductor film;

wherein the rotational acceleration speed in the spin addition method is from 5 to 120 rpm/sec.

2. A method of manufacturing a crystalline semiconductor film, comprising:

a first step of depositing an amorphous semiconductor film containing silicon on an insulating substrate;

a second step of depositing a mask insulating film on the amorphous semiconductor film, and forming an opening region in a portion of the mask insulating film;

a third step of adding a metallic element for promoting crystallization to the mask insulating film by a spin addition method; and

a fourth step of forming a crystalline semiconductor film by heat treating the amorphous semiconductor film;

wherein the rotational acceleration speed in the spin addition method is from 5 to 120 rpm/sec.

3. A method of manufacturing a crystalline semiconductor film, comprising:

a first step of adding a metallic element for promoting crystallization of an amorphous semiconductor film to an insulating substrate by a spin addition method;

a second step of depositing an amorphous semiconductor film containing silicon on the insulating substrate; and

a third step of forming a crystalline semiconductor film containing silicon by heat treating the amorphous semiconductor film;

wherein the rotational acceleration speed y in the spin addition method satisfies $y=Ax^{-B}$ (where x is the diagonal dimension of the substrate, and A and B are constant).

4. A method of manufacturing a crystalline semiconductor film, comprising:

a first step of depositing an amorphous semiconductor film containing silicon on an insulating substrate;

a second step of depositing a mask insulating film on the amorphous semiconductor film, and forming an opening region in a portion of the mask insulating film;

a third step of adding a catalyst element for promoting crystallization to the mask insulating film by a spin addition method; and

a fourth step of forming a crystalline semiconductor film by heat treating the amorphous semiconductor film;

wherein the rotational acceleration speed y in the spin addition method satisfies $y=Ax^{-B}$ (where x is the diagonal dimension of the substrate, and A and B are constant).

5. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the insulating substrate has a square shape.

6. A method of manufacturing a crystalline semiconductor film according to claim 2, wherein the insulating substrate has a square shape.

7. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the insulating substrate has a square shape.

8. A method of manufacturing a crystalline semiconductor film according to claim 4, wherein the insulating substrate has a square shape.

9. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the length of a diagonal of the insulating substrate is equal to or larger than 500 mm.

10. A method of manufacturing a crystalline semiconductor film according to claim 2, wherein the length of a diagonal of the insulating substrate is equal to or larger than 500 mm.

11. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the length of a diagonal of the insulating substrate is equal to or larger than 500 mm.

12. A method of manufacturing a crystalline semiconductor film according to claim 4, wherein the length of a diagonal of the insulating substrate is equal to or larger than 500 mm.

13. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the maximum value of the rotational velocity in the spin addition method is from 800 to 1200 rpm.

14. A method of manufacturing a crystalline semiconductor film according to claim 2, wherein the maximum value of the rotational velocity in the spin addition method is from 800 to 1200 rpm.

15. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the maximum value of the rotational velocity in the spin addition method is from 800 to 1200 rpm.

16. A method of manufacturing a crystalline semiconductor film according to claim 4, wherein the maximum value of the rotational velocity in the spin addition method is from 800 to 1200 rpm.

17. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the second step is one in which a solution containing the metallic element is dripped onto the insulating substrate while the substrate is rotating.

18. A method of manufacturing a crystalline semiconductor film according to claim 2, wherein the second step is one in which a solution containing the metallic element is dripped onto the insulating substrate while the substrate is rotating.

19. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the second step is one in which a solution containing the metallic element is dripped onto the insulating substrate while the substrate is rotating.

20. A method of manufacturing a crystalline semiconductor film according to claim 4, wherein the second step is one in which a solution containing the metallic element is dripped onto the insulating substrate while the substrate is rotating.

21. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the metallic element is added by spinning using a solution containing one element, or a plurality of elements, selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

22 A method of manufacturing a crystalline semiconductor film according to claim 2, wherein the metallic element is added by spinning using a solution containing one element, or a plurality of elements, selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

23. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the metallic element is added by spinning using

a solution containing one element, or a plurality of elements, selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

24. A method of manufacturing a crystalline semiconductor film according to claim 4, wherein the metallic element is added by spinning using a solution containing one element, or a plurality of elements, selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

25. A method of manufacturing a crystalline semiconductor film according to claim 1, wherein the metallic element for promoting crystallization of the amorphous semiconductor film is added by a spin addition method after forming a base film on the insulating substrate.

26. A method of manufacturing a crystalline semiconductor film according to claim 3, wherein the metallic element for promoting crystallization of the amorphous semiconductor film is added by a spin addition method after forming a base film on the insulating substrate.

27. A crystalline semiconductor film formed over a substrate, wherein:

a concentration of a metallic element for promoting crystallization contained in the crystalline semiconductor film is within range of from $5x10^{12}$ to $1x10^{13}$ atoms/cm^2; and

a minimum concentration region is positioned between both ends of a diagonal direction of the substrate.

28. A crystalline semiconductor film according to claim 27, wherein the domain size of the crystalline semiconductor film is from 15 to 20 μm.

29. A crystalline semiconductor film according to claim 27, wherein the metallic element is one element, or a plurality of elements, selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

30. A semiconductor device that uses the crystalline semiconductor film according to claim 27 as an active layer of a thin film transistor.

31. A semiconductor device that uses the crystalline semiconductor film according to claim 28 as an active layer of a thin film transistor.

32. A semiconductor device that uses the crystalline semiconductor film according to claim 29 as an active layer of a thin film transistor.